

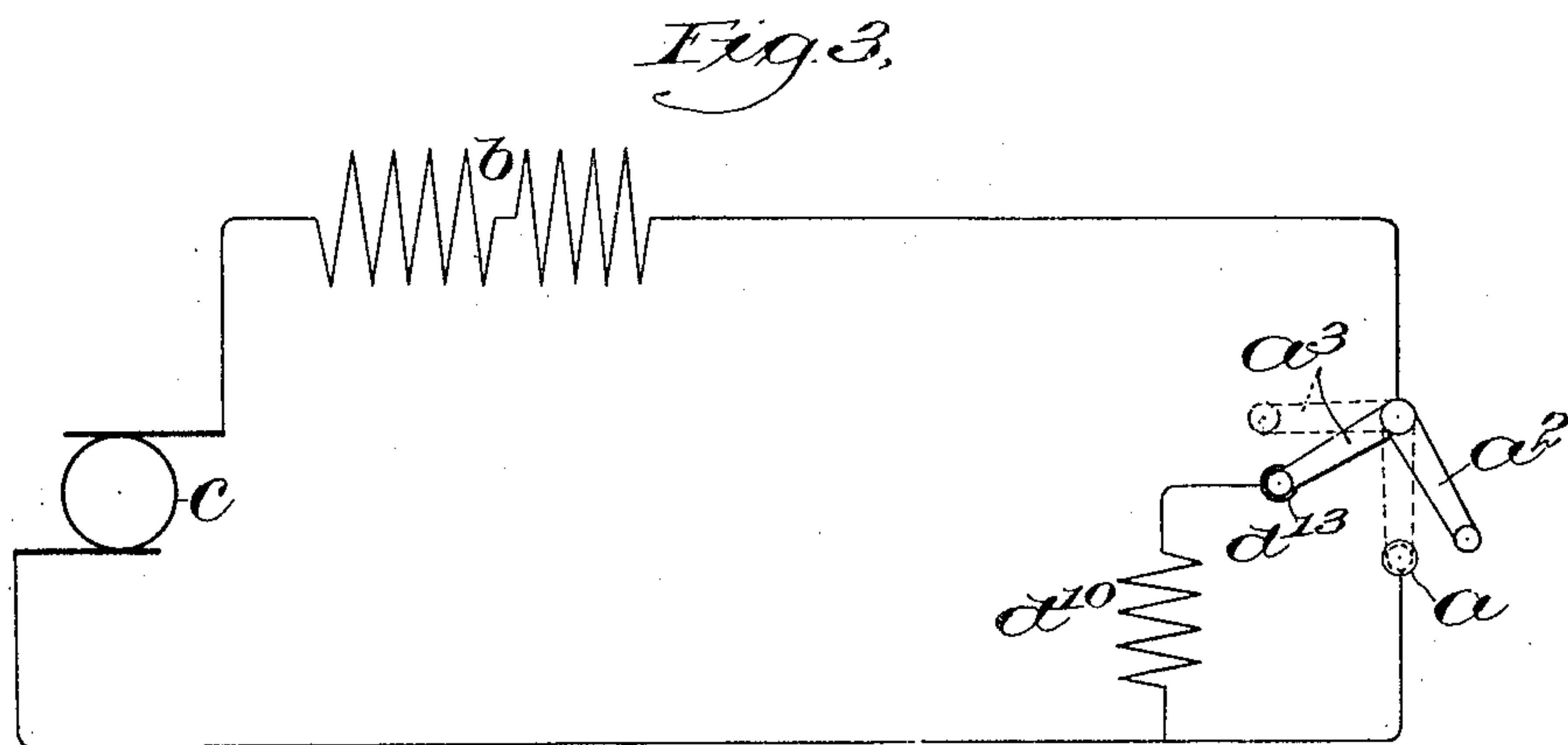
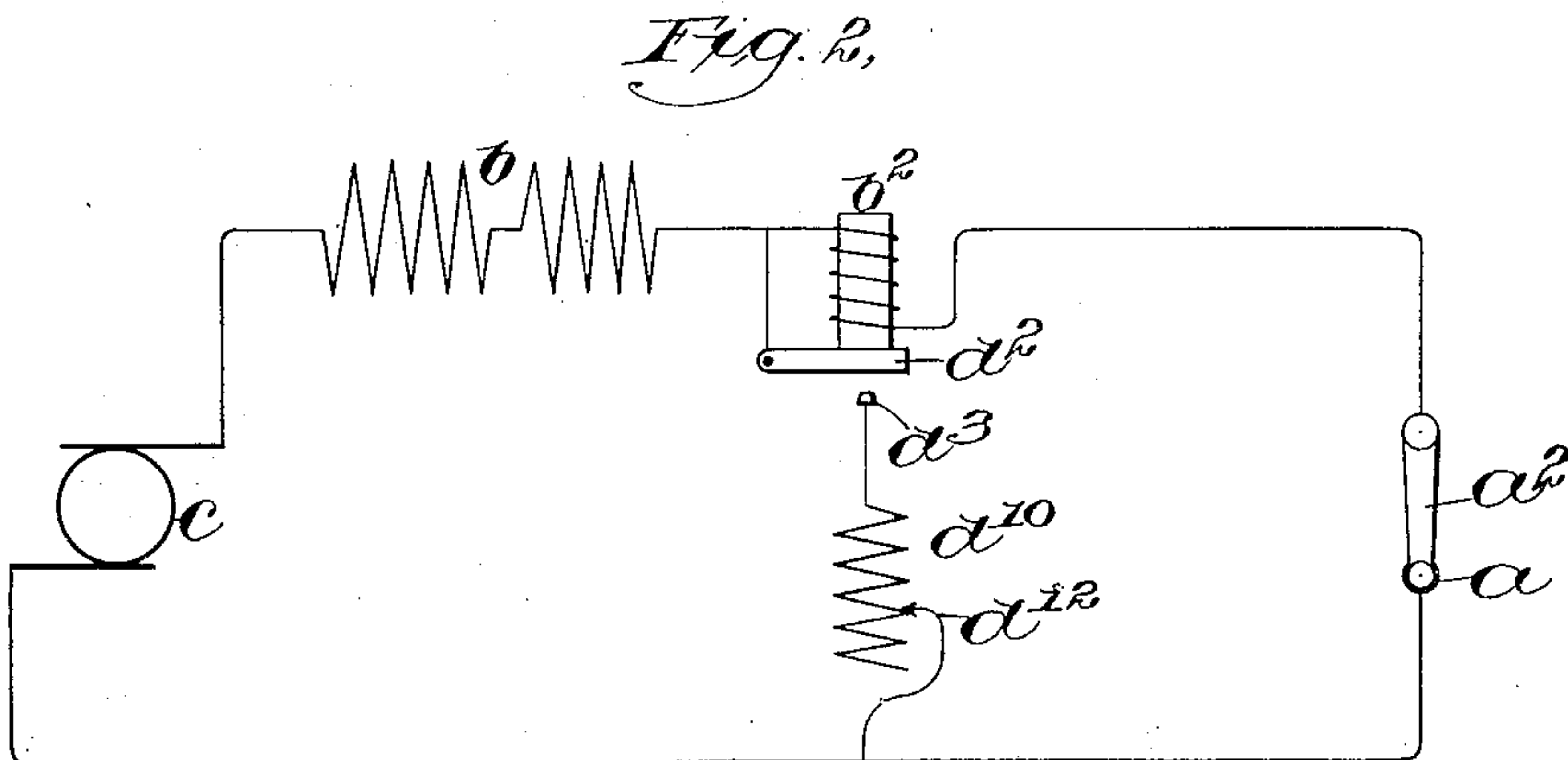
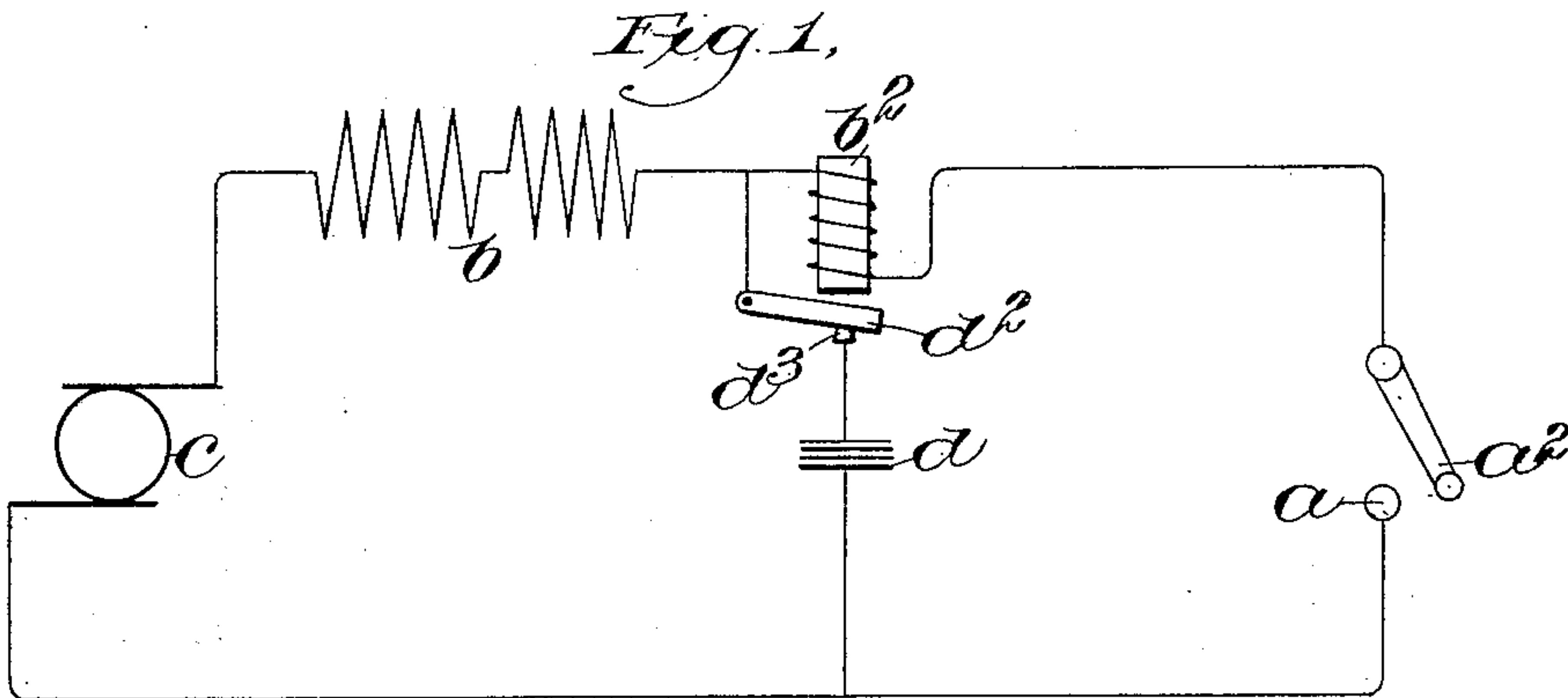
No. 702,695.

Patented June 17, 1902.

D. M. BLISS.
SPARKING DEVICE.

(Application filed Nov. 7, 1901.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

DONALD M. BLISS, OF BROOKLINE, MASSACHUSETTS, ASSIGNOR TO HOLTZER-CABOT ELECTRIC COMPANY, OF BROOKLINE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

SPARKING DEVICE.

SPECIFICATION forming part of Letters Patent No. 702,695, dated June 17, 1902.

Application filed November 7, 1901. Serial No. 81,432. (No model.)

To all whom it may concern:

Be it known that I, DONALD M. BLISS, of Brookline, county of Norfolk, and State of Massachusetts, have invented an Improvement in Sparking Devices, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 The present invention relates to a sparking device for explosion-engines, &c., and is especially adapted for use with such engines when used for locomotive power, as for propelling boats or vehicles.

15 The object of the invention is to utilize as the generator of the current a dynamo driven by the vehicle which is being propelled, it being essential, therefore, that the dynamo should be capable of operating through wide
20 variations in speed and giving sufficient current to produce a spark under all conditions. It is impracticable to use a shunt-wound dynamo for this purpose, for the reason that if the speed is increased to any considerable
25 extent beyond that for which the fields are wound the winding will become overheated or destroyed, while if the speed is reduced to any material extent below that for which the fields are wound the field-coil will not be ex-
30 cited and current will not be produced. On the other hand, where a series-wound dynamo is used while the field can be wound so as to cause the production of current in spite of wide variations in speed it is obvious that
35 each time the sparking contacts are separated to produce the spark the field-circuit will be opened, and the field will lose its strength to such an extent that it will not build up during the time when the spark-gap is closed.
40 To overcome these difficulties and also to obviate the need of employing mechanical speed-regulating devices, which have sometimes been used to regulate the speed of a dynamo, the system is arranged in accordance with the
45 invention, so that an artificial load is introduced into the circuit when the spark-gap is opened, the introduction of said load being controlled in response to the opening and closing of the spark-gap.

Figure 1 is a diagram of a system embody- 50
ing the invention and showing the spark-gap open. Fig. 2 is a similar diagram showing the spark-gap closed and also showing a slight modification, and Fig. 3 a diagram showing a further modification.

Referring to Fig. 1, the contacts a and a^2 55
of the spark-gap are arranged in a circuit which is in series with the field-coils b and the armature-coils c of a series-wound dynamo which generates the current to produce 60
the spark when the contacts a and a^2 are separated. In an explosion-engine, however, the gap is opened and closed very rapidly, and it is obvious that each time it is opened the current will be discharged from the field- 65
coils b , which will not build up sufficiently to remain excited during the time that the spark-gap is closed. In order, therefore, to maintain the field strength, the system is provided with a supplemental circuit con- 70
taining a load, such as a storage battery d , Fig. 1, or resistance d^{10} , Fig. 2, and the circuit containing the said load is arranged to be placed in series with the field-coils b in re-
75 sponse to the separation of the spark-gap terminals. To accomplish this, the supplemental circuit, containing the load, is provided with a break having a circuit-closer which is adapted to operate in response to the flow of current through the circuit con- 80
taining the spark-gap. It is obvious that various means may be employed to operate the said circuit-closer and that either electrical or mechanical devices may be employed for the purpose, as shown. One terminal of the 85
supplemental circuit is carried by an armature d^2 , which is under the control of an electromagnet b^2 in the main circuit, so that when the contacts a and a^2 are together, as shown in Fig. 2, closing the main circuit, the elec- 90
tromagnet b^2 will be energized, attracting the armature d^2 and carrying the same away from the contact d^3 , thereby breaking the auxiliary circuit, so that the entire current flows through the main circuit ready to discharge 95
when the spark-gap is opened. Upon the opening of the spark-gap, however, the electromagnet b^2 becomes deenergized, so that the ar-

mature d^2 moves into contact with the contact-
 piece d^3 , closing the auxiliary circuit through
 a resistance or other load which then is in se-
 ries with the field-coils b , so that the said
 5 field-coils remain excited. The load d may
 be of any suitable nature, being indicated in
 Fig. 1 as a few cells of a storage battery and
 in Fig. 2 as a resistance d^{10} , having an ad-
 justable contact member d^{12} , whereby the
 10 amount of the resistance can be regulated, if
 desired. The same result, however, can be ob-
 tained by mechanical means, as indicated in
 Fig. 3, in which the resistance d^{10} is shown as
 contained in a circuit having a terminal d^{13} ,
 15 which is adapted to coöperate with a circuit-
 closing member a^3 , connected with and car-
 ried by the member a^2 and so arranged that
 in the movement of the said member a^2 , which
 separates the same from the member a to
 20 break the main circuit and produce a spark,
 the member a^3 will come into contact with
 the contact-piece d^{13} , completing the auxiliary
 circuit through the resistance.

It is not intended to limit the invention to
 25 the specific construction shown and de-
 scribed, since modifications may be made
 without departing from the invention.

I claim—

1. The combination with a series-wound dy-
 30 namo; of a sparking device in the main cir-
 cuit thereof; a branch circuit connecting the

conductors of the main circuit; a circuit-con-
 troller in said branch circuit; and means for
 operating said circuit-controller to close said
 branch circuit when the main circuit is open 35
 and vice versa, substantially as and for the
 purpose described.

2. The combination with a series-wound dy-
 namo; of a sparking device in the main cir-
 cuit thereof; a branch circuit connecting the 40
 conductors of the main circuit; a circuit-con-
 troller in said branch circuit; and means op-
 erated by said sparking device for operating
 said circuit-controller, substantially as de-
 scribed. 45

3. The combination with a series-wound dy-
 namo; of a sparking device in the main cir-
 cuit thereof; a branch circuit connecting the
 conductors of the main circuit; an adjustable
 load in said branch circuit; a circuit-con- 50
 troller in said branch circuit; and means op-
 erated by said sparking device for operating
 said circuit-controller, substantially as de-
 scribed.

In testimony whereof I have signed my 55
 name to this specification in the presence of
 two subscribing witnesses.

DONALD M. BLISS.

Witnesses:

HENRY J. LIVERMORE,
 JAS. J. MALONEY.